

US006367307B1

# (12) United States Patent Reise et al.

(10) **Patent No.:** 

US 6,367,307 B1

(45) **Date of Patent:** 

Apr. 9, 2002

# (54) CALIBRATED STOP BOLT FOR LONGITUDINAL SHOCK TEST FIXTURE

(75) Inventors: Christa M. Reise, Portsmouth, RI (US); James C. Butts, Casco, ME (US)

(73) Assignee: The United States of America as represented by the Secretary of the

Navy, Washington, DC (US)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21)	Appl.	No.:	09/267,916

(56)

(22) Filed: Mar. 2, 1999

(51) **Int. Cl.**<sup>7</sup> ...... **G01N 3/30;** G01N 3/32; G01N 7/00; G01P 15/00

C!! 1

#### References Cited

#### U.S. PATENT DOCUMENTS

5,025,744 A	*	6/1991	Moody		114/238
-------------	---	--------	-------	--	---------

5.174,236 A	* 12/1992	Moody 114/238
5,551,279 A	* 9/1996	Quick 73/12.01
		Quick 114/238
		Manahan, Sr 73/12.01

#### \* cited by examiner

Primary Examiner—Benjamin R. Fuller Assistant Examiner—Octavia Davis

(74) Attorney, Agent, or Firm-Michael J. Mcgowan;

James M. Kasischke; Prithvi C. Lall

## ABSTRACT

A calibrated stop bolt is provided for measuring the dynamic load transmitted to the calibrated stop bolt during a shock test. The stop bolt includes an anterior extension and a posterior extension, for restraining a torpedo bearing plate therebetween, and also includes a plurality of strain gauges mounted at the top portion of each extension. In one embodiment, eight strain gauges are utilized, with two strain gauges placed on each side of the two extensions, i.e., in a full bridge arrangement. The calibrated stop bolt is preferably mounted to a base plate and bolted at each end to a longitudinal test fixture. The calibrated stop bolt can be utilized with a conventional longitudinal shock test fixture, torpedo shape and heavy weight shock machine.

## 18 Claims, 3 Drawing Sheets

